Guest Editorial
Deep Meta-Learning and Explainable Artificial Intelligence (XAI): Methodologies, Interactivity and Applications

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When it comes to technological development, many countries nowadays consider Artificial Intelligence (AI) to be a critical area of interest. Deep learning (DL) and machine learning (ML) are major branches of AI. Current AI systems can run many high-performance algorithms and provide advanced recognition capabilities. However, there is concern over transparency in AI development because we can only know the input information and the output results without having access to the entire computation process and other data. The 'black box' nature of DL and ML makes their inner workings difficult to understand and interpret. The deployment of explainable artificial intelligence (XAI) can help explain why and how the outputs of DL and ML models are generated. As a result, an understanding of the functioning, behavior, and outputs of models can be garnered, reducing bias and error and improving confidence in decision-making.

Explainable artificial intelligence (XAI) is one of the interesting issues that has emerged recently. Many researchers are trying to address the subject from different dimensions, and interesting results have emerged. Currently, machine learning and deep learning have been applied to many complex fields, such as medicine, finance, self-driving cars and other fields related to daily life. Since these models have been applied to these fields with good results, future applications will also expand to cognitive assistance, explainable science, and the development of reliable models. Although good results can be obtained using AI models, these models lack the disclosure of key information and the explanation of model operation. Therefore, many researchers suggest the AI model should not be just a black box, as nobody knows the reason or the detailed relationship between features and results. Hence, the concept of explainable AI was advocated. The key concept is to make the entire process of AI algorithms – from input and the decision-making process to output results – accessible and traceable. As a result, users and operators can utilize XAI to produce transparent explanations and reasons for the decisions made, reinforcing trust and confidence in an AI system's reliability.

For this special issue, it aims to explore XAI applications and researches in more areas of study and see how XAI models can take a vast amount of available data and discover undiscovered phenomena, retrieve useful knowledge, and draw conclusions and

reasoning. There are 15 papers accepted for publication. A quick overview of the papers in this issue is provided below, and we expect the content may draw attention from the public readers, and furthermore, promote societal development.

The article entitled "Analyzing the Operational Efficiency of Online Shopping Platforms Integrated with AI-Powered Intelligent Warehouses", by Wang et al. adopts the Data Envelopment Analysis (DEA) model to evaluate the operating efficiency of online shopping platforms integrated with AI, IoT, and big data analysis. The proposed system can provide convenient, secure, and novel shopping experiences for consumers.

The article entitled "Deep Learning-Driven Decision Tree Ensembles for Table Tennis: Analyzing Serve Strategies and First-Three-Stroke Outcomes", by Chang et al., develops a hybrid AI system by proposing the deep learning-driven decision tree ensemble algorithms (DLDDTEA) for table tennis match analysis. The results show the proposed system can provide a comprehensive framework for table tennis match analysis, understanding of players' strengths and weaknesses, and facilitate suitable training and competitive strategies.

The article entitled "Exploring Factors Affecting User Intention to Accept Explainable Artificial Intelligence", by Wang and Chiou, proposes a research model grounded in the characteristics of XAI and prior technology acceptance studies. The results point out that perceived value and perceived need would be the key determinants of users' intention to adopt XAI technologies and applications.

The article entitled "Development of an Explainable AI-Based Disaster Casualty Triage System", by Hsiao et al., designs and implement an XAI-based disaster casualty triage scenario system. The proposed system can develop different scenarios using generative AI (GAI) and utilize XAI to improve data transparency. Through the simulation in the training games, users can improve their judgment and responsiveness, further strengthen their rapid reaction and deal with the disaster scenarios.

The article entitled "The Integration of Artificial Intelligence and Ethnic Music Cultural Inheritance under Deep Learning", by Chang, applies the AI technology to improve the ethnic music cultural inheritance, and analyzes its music background and content in advance. This research can improve the accuracy of music emotion recognition, thus protecting the inheritance of ethnic music more effectively.

The article entitled "The Analysis of Deep Learning-based Football Training under Intelligent Optimization Technology", by Luan et al., integrates the Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNN) to optimize the action recognition, and related football data analysis in the college football training courses.

The article entitled "Three-Dimensional Visualization Design Strategies for Urban Smart Venues under the Internet of Things", by Liu, proposes the various 3D visualization methods to examine the proposed application in urban smart venues more effectively. The empirical results indicate the combination of databases and browsers would affect the 3D visualization rendering performance in IoT environments significantly.

The article entitled "Smart Home Management Based on Deep Learning: Optimizing Device Prediction and User Interface Interaction", by Liang et al., integrates the Convolutional Neural Network (CNN) and Long Short-Term Memory (LSTM) to improve the accuracy of smart device status predictions. The proposed system can also decrease the utilization rates of the CPU, memory, GPU, and network bandwidth by 15%, 18%, 25%, and 20%, respectively.

The article entitled "Application of Deep Learning-Based Personalized Learning Path Prediction and Resource Recommendation in Graduate Education", by Li and Ding, adopts the LSTM network to predict the personal learning paths of learners. Besides, they also develop a hybrid recommendation mechanism by combining collaborative filtering and content-based filtering methods to provide the resource recommendation for the learners.

The article entitled "Effectiveness of Game Technology Applied to Preclinical Training for Nurse Aides in Implementing Contact Isolation Precautions", by Lin and Subeq, adopts the game technology and scaffolding theory to design and develop a mobile app for isolation protection capabilities of nurse aides interactive teaching. The results indicate that the proposed mobile app can significantly improve cognition, skills, and self-efficacy for the nurse aides, and demonstrates the usefulness of game technology in e-learning.

In "The Analysis of Intelligent Urban Form Generation Design based on Deep Learning", by Lian et al., presents a DL-based framework for generating intelligent urban morphology, including the network structures of deep learning models, and fine-tuning for the hyperparameter optimization.

In "Impact of Inspirational Film Appreciation Courses on College Students by Voice Interaction System and Artificial Intelligence", by Fan and Song, raises the mental health education level of college students and recommend the adoption of AI in college education for freshmen in the universities.

In "Leveraging AI and Diffusion Models for Anime Art Creation: A Study on Style Transfer and Image Quality Evaluation", by Shen et al., concentrates on the capabilities of an open-source AI image generation model. The proposed method can solve the widespread challenges of style consistency and image quality issues.

In "Usage Intention of the Reservation System of Taipei Sports Center from the Perspective of Technology Readiness Index", by Lin et al., investigates the usage intention of the reservation system of Taipei Sports Center from the perspective of Technology Readiness Index. The proposed framework can focus on the application of technology readiness theory in the sports research domain and offer a good reference for the acceptance of technology services.

The last but not the least paper is "Applying MSEM to Analyze People's Cognitive Behavior towards Virtual Reality Sport Experience", by Li et al. The authors investigate the virtual reality experience to examine the motivations and cognitive behaviors of the public opinion towards sports and fitness.